(3) The applicant may request that any test conducted by the Administrator that was a material factor in making the determination be repeated.

(Secs. 110, 301(a), 313, 319, Clean Air Act (42 U.S.C. 7410, 7601(a), 7613, 7619))

[41 FR 11256, Mar. 17, 1976, as amended at 44 FR 27571, May 10, 1979]

## Subpart B—Procedures for Testing Performance Characteristics of Automated Methods $SO_2$, CO, $O_3$, and $NO_2$

### § 53.20 General provisions.

(a) The test procedures given in this subpart shall be used to test the performance of candidate automated methods against the performance specifications given in table B–1. A test analyzer representative of the candidate automated method must exhibit performance better than, or equal to, the specified value for each such specification (except Range) to satisfy the requirements of this subpart. Except as provided in paragraph (b) of this section, the range of the candidate method must be the range specified in table B–1 to satisfy the requirements of this subpart.

(b) For a candidate method having more than one selectable range, one range must be that specified in table B–1 and a test analyzer representative of the method must pass the tests required by this subpart while operated in that range. The tests may be repeated for a broader range (i.e., one extending to higher concentrations) than that specified in table B–1 provided that the range does not extend to concentrations more than two times the upper range limit specified in table B–1. If the application is for a reference method determination, the tests may be repeated for a narrower range (one extending to lower concentrations) than that specified in table B–1. If the tests are conducted or passed only for the specified range, any reference or equivalent method determination with respect to the method will be limited to that range. If the tests are passed for both the specified range and a broader range (or ranges), any such determination will include the broader range(s) as well as the specified range, provided that the tests required by subpart C of this part (if applicable) are met for the broader range(s). If the tests are passed for both the specified range and a narrower range, a reference method determination for the method will include the narrower range as well as the specified range. Appropriate test data shall be submitted for each range sought to be included in a reference or equivalent method determination under this paragraph (b).

(c) For each performance specification (except Range), the test procedure shall be initially repeated seven (7) times to yield 7 test results. Each result shall be compared with the corresponding specification in table B–1; a value higher than or outside that specified constitutes a failure. These 7 results for each parameter shall be interpreted as follows:

(1) Zero (0) failures: Candidate method passes the performance parameter.

(2) Three (3) or more failures: Candidate method fails the performance parameter.

(3) One (1) or two (2) failures: Repeat the test procedures for the parameter eight (8) additional times yielding a total of fifteen (15) test results. The combined total of 15 test results shall then be interpreted as follows:

(i) One (1) or two (2) failures: Candidate method passes the performance parameter.

(ii) Three (3) or more failures: Candidate method fails the performance parameter.

TABLE B–1—PERFORMANCE SPECIFICATIONS FOR AUTOMATED METHODS

| Performance parameter | Units [1] | Sulfur dioxide | Photochemical oxidants | Carbon monoxide | Nitrogen dioxide | Definitions and test procedures |
|---|---|---|---|---|---|---|
| 1. Range | Parts per million | 0–0.5 | 0–0.5 | 0–50 | 0–0.5 | Sec. 53.23(a). |
| 2. Noise | do | .005 | .005 | .50 | .005 | Sec. 53.23(b). |
| 3. Lower detectable limit | Parts per million | .01 | .01 | 1.0 | .01 | Sec. 53.23(c). |
| 4. Interference equivalent | | | | | | Sec. 53.23(d). |
| Each interferant | Parts per million | ±.02 | ±.02 | ±1.0 | ±0.02 | |

TABLE B–1—PERFORMANCE SPECIFICATIONS FOR AUTOMATED METHODS—Continued

| Performance parameter | Units [1] | Sulfur dioxide | Photochemical oxidants | Carbon monoxide | Nitrogen dioxide | Definitions and test procedures |
|---|---|---|---|---|---|---|
| Total interferant | .....do | .06 | .06 | 1.5 | .04 | |
| 5. Zero drift, 12 and 24 hour | .....do | ±.02 | ±.02 | ±1.0 | ±.02 | Sec. 52.23(e). |
| 6. Span drift, 24 hour | ..... | ..... | ..... | ..... | ..... | Do. |
| 20 percent of upper range limit | Percent | ±20.0 | ±20.0 | ±10.0 | ±20.0 | |
| 80 percent of upper range limit | .....do | ±5.0 | ±5.0 | ±2.5 | ±5.0 | |
| 7. Lag time | Minutes | 20 | 20 | 10 | 20 | Do. |
| 8. Rise time | .....do | 15 | 15 | 5 | 15 | Do. |
| 9. Fall time | .....do | 15 | 15 | 5 | 15 | Do. |
| 10. Precision | ..... | ..... | ..... | ..... | ..... | Do. |
| 20 percent of upper range limit | Parts per million | .01 | .01 | .5 | .02 | |
| 80 percent of upper range limit | .....do | .015 | .01 | .5 | .03 | |

[1] To convert from parts per million to μ g/m$^3$ at 25 °C and 760 mm Hg, multiply by M/0.02447, where *M* is the molecular weight of the gas.

(d) The tests for *zero drift, span drift, lag time, rise time, fall time,* and *precision* shall be combined into a single sequential procedure to be conducted at various line voltages and ambient temperatures specified in § 53.23(e). The tests for *noise, lower detectable limit,* and *interference equivalents* shall be made at any temperature between 20 °C. and 30 °C. and at any normal line voltage between 105 and 125 volts, and shall be conducted such that not more than three (3) test results for each parameter are obtained per 24 hours.

(e) All response readings to be recorded shall first be converted to concentration units according to the calibration curve constructed in accordance with § 53.21(b).

(f) All recorder chart tracings, records, test data and other documentation obtained from or pertinent to these tests shall be identified, dated, signed by the analyst performing the test, and submitted.

NOTE: Suggested formats for reporting the test results and calculations are provided in Figures B–2, B–3, B–4, B–5, and B–6 in appendix A. Symbols and abbreviations used in this subpart are listed in table B–5, appendix A.

[40 FR 7049, Feb. 18, 1975, as amended at 40 FR 18168, Apr. 25, 1975; 41 FR 52694, Dec. 1, 1976]

### § 53.21 Test conditions.

(a) *Set-up and start-up* of the test analyzer shall be in strict accordance with the operating instructions specified in the manual referred to in § 53.4(b)(3). Allow adequate warm-up or stabilization time as indicated in the operating instructions before beginning the tests. If the candidate method does not include an integral strip chart recorder, connect the output signal of the test analyzer to a suitable strip chart recorder of the servo, null-balance type. This recorder shall have a chart width of at least 25 centimeters, chart speeds up to 10 cm per hour, a response time of 1 second or less, a deadband of not more than 0.25 percent of full scale, and capability either of reading measurements at least 5 percent below zero or of offsetting the zero by at least 5 percent.

NOTE: Other data acquisition components may be used along with the chart recorder during conduct of these tests. Use of the chart recorder is intended only to facilitate evaluation of data submitted.

(b) *Calibration* of the test analyzer shall be as indicated in the manual referred to in § 53.4(b)(3) and as follows: If the chart recorder does not have below zero capability, adjust either the controls of the test analyzer or the chart recorder to obtain a +5% offset zero reading on the recorder chart to facilitate observing negative response or drift. If the candidate method is not capable of negative response, the test analyzer (not recorder) shall be operated with an offset zero. Construct and submit a calibration curve showing a plot of recorder scale readings (ordinate) against pollutant concentrations (abscissa). A plot of output units (volts, millivolts, milliamps, etc.) against pollutant concentrations shall also be shown for methods not including an integral chart recorder. All such plots